Trend Study 11B-1-00

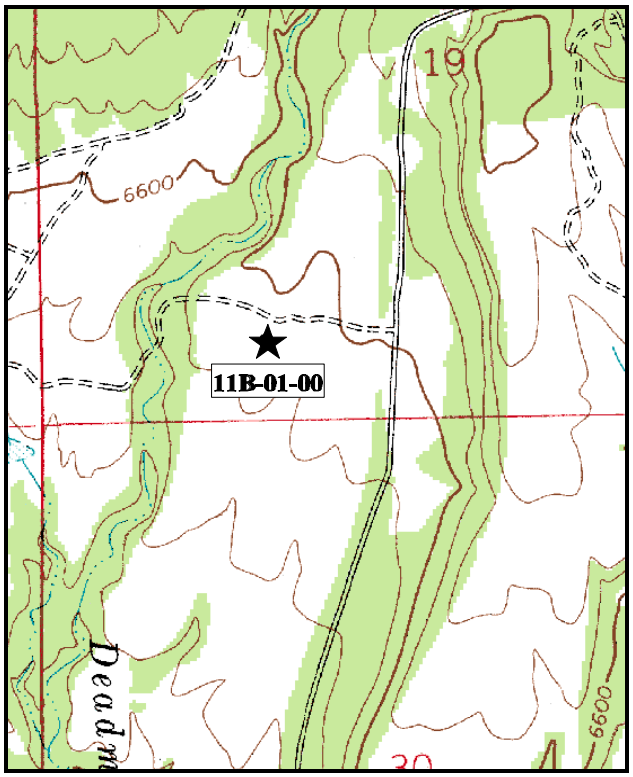
Study site name: Deadman . Range type: Chained, Cabled, Seeded P-J

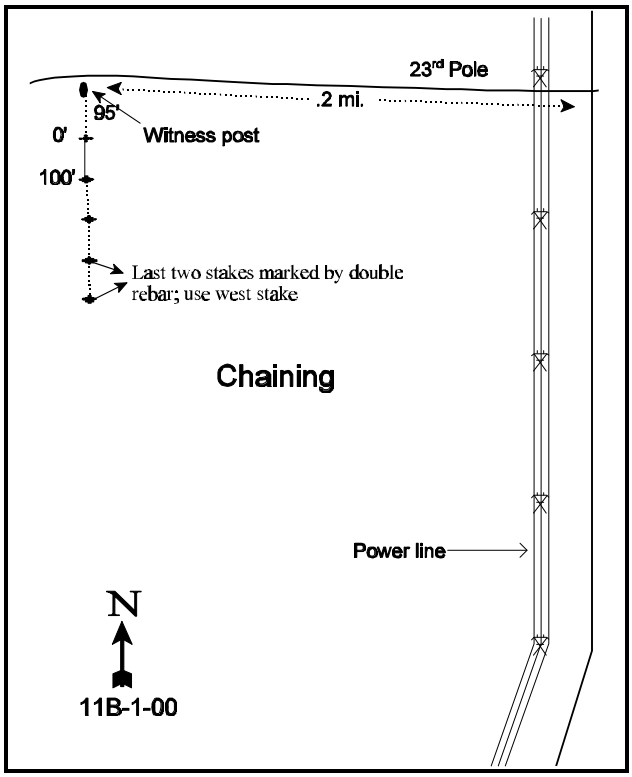
Compass bearing: frequency baseline 165°M.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Belt 1 rebar @ 1ft and belt 3 rebar @ 10 ft.

LOCATION DESCRIPTION

From the southeast end of Price, take the Airport Road east 3.1 miles to the airport. Continue 0.9 miles to a power line (and a left turn to the Airport transect). Proceed 0.45 miles to an intersection. Stay left on the main road for 1.15 miles to a corral and a fork to the right which leads to the Airport Bench transect. There is a bend in the power line on the left. Stay left and proceed up the main road another 1.7 miles (to the 23rd pole from the bend in the power line) and turn left. Proceed 0.2 miles, passing power pole #365, to a witness post (a green fence post with browse tag #7854) on the left side of the road in a chaining. The transect starts 95 feet south of the witness post. The transect is marked by rebar stakes, 1 to 2 ½ feet in height.





Map Name: Deadman Canyon

Diagrammatic Sketch

Township 13S , Range 11E , Section 19

UTM. 4391636.481 N, 522922.385 E

DISCUSSION

Trend Study No. 11B-1 (32-1)

Located near the mouth of Deadman Canyon, the Deadman trend study samples winter range on the bench lands northeast of Price and south of the Book Cliffs. Much of the area (managed by the BLM Price River Resource Area) was chained and seeded in 1965-66. Since the treatment, young surviving pinyon and juniper trees have resumed dominance of the area. Wood cutting (chained wood only) and Christmas tree cutting is allowed on the chained area. Human pressure is high with numerous roads making it very accessible. There is also activity associated with the coal mines located further up the canyon. This area lies within the Coal Creek allotment which is grazed by cattle from mid-April to the end of May and again during the month of October. Wildlife use appears to have declined since 1994. Quadrat frequency of deer and rabbit pellet groups was high in 1994 at 44% and 42% respectively, but numbers dropped dramatically in 2000 to 23% for rabbit and 15% for deer. A pellet group transect read on site in 2000 estimates only 19 deer use days/acre (47 ddu/ha).

The site elevation is 6,600 feet with a slope of 3% or less on a southern exposure. The study is near Deadman Creek, which only contains water seasonally. It drains south into the Price River. There is a fair amount of litter protecting the soil surface, much of it large persistent litter from the chaining. However, there are large areas of bare soil in the shrub and tree interspaces. Erosion does not appear to be a problem, even with large amounts of bare soil. Soil texture is a sandy loam with a mildly alkaline pH of 7.5. The soil appears moderately deep overall with an effective rooting depth estimated at almost 15 inches. Rock and pavement is common on the surface and within the profile with most of the rock concentrated in the upper 8 inches. Much of the rock contains a calcium carbonate coating and some areas have developed a weak hardpan at a depth of about 12 inches. There is also some exposed sandstone bed rock in the area. Phosphorus could be a limiting factor at only 4.3 ppm, as values less than 10 ppm may limit normal plant growth and development.

The most abundant key browse species is true mountain mahogany. It made up only 15% of the browse cover in 1994 and 12% in 2000 with an estimated density of 100 plants/acre in both 1994 and 2000. These plants have spread naturally into the area. The majority of the mountain mahogany encountered were vigorous mature plants that showed only light to moderate use in 1986 and 1994. However, use was heavy on 60% of the plants sampled in 2000. The tallest portions of these plants are growing out of reach of browsing animals, but their bushy growth habit provides good amounts of available forage. Important browse species that were seeded when the area was chained, include fourwing saltbush and bitterbrush. Individuals of these species are widely scattered and are mostly older plants. They don't appear to be reproducing as well as the mountain mahogany although the plants are vigorous and putting on good growth. A few Mountain big sagebrush occur in the area but no plants were sampled in the shrub density strips. Green ephedra is vigorous with an estimated density of 160 plants/acre in 2000. Use was very heavy in 2000 with 75% of the plants sampled showing heavy use. Vigor was also reduced on 13% of the population.

Broom snakeweed is the most abundant shrub on the site with a density that has increased from zero in 1984 to 760 plants/acre in 1994 and 9,380 plants/acre by 2000. Most of the population (87%) is mature, but young plants are common and the population may increase in the future. Pinyon and juniper dominate the overstory by providing 77% and 74% of the total browse cover in 1994 and 2000 respectively. There is evidence of light browsing on the juniper. Both the juniper and pinyon appear to be resuming their dominance of the site. Point-quarter data from 2000 estimate 104 pinyon and 183 juniper trees/acre with an average diameter of 3.6 and 2.1 inches respectively. Nearly all of the pinyon and juniper appear to have been released by the chaining. This area needs to be retreated to reduce the pinyon-juniper competition. Pinyon and juniper trees are still small enough to be treated by a roller-chop.

The seeding of crested wheatgrass established a fair stand. However plants are scattered in small patches, are small in stature, and only provided 5% cover in 1994 and 4% in 2000. The grass has been grazed heavily in the past but current ('00) use appears light.

A wide variety of forbs are found, although none provide significant forage. All forbs combined, on average provide less than 2% cover. Seeded alfalfa was encountered in 8 quadrats in 1986 but significantly declined in nested frequency by 1994. It was not sampled in 2000 and appears to be dying out due to the extended drought.

1986 APPARENT TREND ASSESSMENT

In terms of providing important winter forage for deer, this area appears to have an overall downward trend as pinyon and juniper increase in size. Much of the mountain mahogany has become unavailable due to height. Browse reproduction and variety are encouraging signs for this site to become good winter range. Management should strive to maintain the mountain mahogany and other browse species. Continued removal of the increasing pinyon-juniper with firewood and Christmas tree harvest is desirable. The soil is in good condition and trend appears stable.

1994 TREND ASSESSMENT

With the continuing drought, trend for soil is down with the increase in percent bare ground, a decrease in litter cover, and a significant decrease in crested wheatgrass. Key browse species are in low numbers, with the increaser broom snakeweed the most numerous shrub. However, the browse trend is stable to slightly improving. Trend for the herbaceous understory is slightly downward as the majority of the cover is contributed by crested wheatgrass which has decreased significantly in nested frequency since 1986.

TREND ASSESSMENT
soil - down (1)
browse - stable to slightly improving (4)
herbaceous understory - slightly downward (2)

2000 TREND ASSESSMENT

Trend for soil appears stable. Percent cover of bare ground increased slightly, but the ratio of bare soil to protective cover is almost unchanged. Relative cover of vegetation, litter and bare ground have remained similar between readings. There is some erosion occurring but it is minimized by the gentle terrain. Herbaceous vegetation is not abundant but sum of nested frequency of perennial grasses has remained similar to 1994. Trend for browse is down. Use of the preferred browse species, mountain mahogany, rubber rabbitbrush, and green ephedra is extremely high. In addition, percent decadency and plants with poor vigor has increased for rubber rabbitbrush and green ephedra, and density of the increaser broom snakeweed has exploded from 760 plants/acre in 1994 to 9,380 in 2000. Pinyon and juniper trees are also increasing in size and density. Point-quarter data from 2000 estimate 104 pinyon and 183 juniper trees/acre with an average diameter of 3.6 and 2.1 inches respectively. Nearly all of the pinyon and juniper trees appear to have been released by the chaining since only 5% of the trees sampled were surviving chained trees. These trees currently account for 55% of the total vegetative cover and produce 12% overhead canopy cover. Key browse species are low in number and without some sort of retreatment of the site to control pinyon and juniper, this area will no longer contain enough useful browse forage to be considered an important winter range. Trend for perennial grasses appears stable with similar sum of nested frequency values compared to 1994. Sum of nested frequency of perennial forbs has declined slightly but forbs were never very abundant. Overall, the herbaceous trend is considered stable but in poor condition. Herbaceous forage is limited with grasses and forbs combining to produce only 6% cover.

TREND ASSESSMENT
soil - stable (3)
browse - down (1)
herbaceous understory - stable (3), but in poor condition

HERBACEOUS TRENDS --
Herd unit 11B, Study no: 1

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'86	'94	'00	'86	'94	'00	'94	'00
G	Agropyron cristatum	$_{b}$292	$_{a}$223	$_{a}$237	97	85	89	5.12	4.13
G	Aristida purpurea	-	4	1	-	2	1	.03	.15
G	Oryzopsis hymenoides	8	8	10	5	5	5	.08	.08
Total for Annual Grasses		0	0	0	0	0	0	0	0
Total for Perennial Grasses		300	235	248	102	92	95	5.24	4.36
Total for Grasses		300	235	248	102	92	95	5.24	4.36
F	Arabis perennans	$_{b}$16	$_{a}$-	$_{a}$-	7	-	-	-	-
F	Astragalus convallarius	5	-	1	2	-	1	.00	.00
F	Chenopodium fremontii (a)	-	2	-	-	1	-	.00	-
F	Cryptantha fulvocanescens	43	44	51	21	21	25	.58	1.02
F	Descurainia pinnata (a)	-	$_{b}$5	$_{a}$-	-	3	-	.01	-
F	Eriogonum alatum	-	-	4	-	-	2	-	.01
F	Eriogonum umbellatum	19	16	15	8	8	7	.09	.13
F	Euphorbia spp.	$_{b}$80	$_{a}$24	$_{a}$30	35	10	17	.07	.11
F	Hedysarum boreale	5	-	-	3	-	-	-	-
F	Ipomopsis aggregata	$_{b}$3	$_{b}$8	$_{a}$-	3	3	-	.01	-
F	Lesquerella ludoviciana	$_{a}$-	$_{b}$21	$_{a}$2	-	11	1	.10	.00
F	Lithospermum multiflorum	2	2	-	1	1	-	.01	-
F	Machaeranthera canescens	$_{a}$-	$_{b}$20	$_{a}$1	-	10	1	.12	.00
F	Machaeranthera grindelioides	$_{ab}$4	$_{b}$5	$_{a}$-	2	3	-	.01	-
F	Medicago sativa	$_{b}$18	$_{b}$5	$_{a}$-	8	3	-	.04	-
F	Penstemon caespitosus	$_{a}$-	$_{b}$3	$_{a}$-	-	3	-	.01	-
F	Penstemon cyanocaulis	31	27	14	15	12	7	.16	.09
F	Salsola iberica (a)	-	$_{b}$77	$_{a}$-	-	26	-	.82	-
F	Sphaeralcea coccinea	$_{a}$5	$_{b}$20	$_{ab}$15	2	7	6	.11	.22
F	Townsendia incana	14	7	12	7	2	6	.01	.03
Total for Annual Forbs		0	84	0	0	30	0	0.84	0
Total for Perennial Forbs		245	202	145	114	94	73	1.36	1.64
Total for Forbs		245	286	145	114	124	73	2.21	1.64

Values with different subscript letters are significantly different at % = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 11B, Study no: 1

Type	Species	Strip Frequency '94	Strip Frequency '00	Average Cover % '94	Average Cover % '00
B	Cercocarpus montanus	5	5	1.46	2.04
B	Chrysothamnus nauseosus albicaulis	0	7	-	.38
B	Chrysothamnus nauseosus hololeucus	5	0	.00	-
B	Ephedra viridis	4	6	.03	.18
B	Gutierrezia sarothrae	14	57	.45	1.75
B	Juniperus osteosperma	0	12	3.27	5.59
B	Opuntia spp.	5	5	.00	.03
B	Pinus edulis	0	8	4.42	7.23
B	Purshia tridentata	2	1	.38	.03
Total for Browse		35	101	10.03	17.25

CANOPY COVER --
Herd unit 11B, Study no: 1

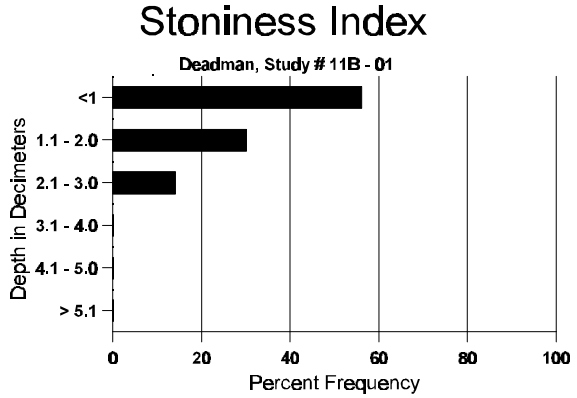
Species	Percent Cover '00
Juniperus osteosperma	5
Pinus edulis	7

BASIC COVER --
Herd unit 11B, Study no: 1

Cover Type	Nested Frequency '94	Nested Frequency '00	Average Cover % '86	Average Cover % '94	Average Cover % '00
Vegetation	285	271	6.25	17.24	25.72
Rock	282	186	2.25	8.81	9.61
Pavement	292	317	10.00	4.03	9.95
Litter	388	360	58.25	30.11	34.09
Cryptogams	6	13	0	.18	.13
Bare Ground	310	312	23.25	29.17	37.48

SOIL ANALYSIS DATA --
Herd Unit 11B, Study # 1, Study Name: Deadman

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
14.88	52.4 (14.09)	7.5	57.3	24.7	18.0	2.6	4.3	70.4	0.8



PELLET GROUP FREQUENCY --
Herd unit 11B, Study no: 1

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'94	'00	'00	'00
Sheep	-	1	18	N/A
Rabbit	44	23	26	N/A
Elk	5	-	-	-
Deer	42	15	244	19 (47)
Cattle	-	2	35	3 (7)

BROWSE CHARACTERISTICS --
Herd unit 11B, Study no: 1

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	5	0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	29	62	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'86	0		-
	'94	0		-
	'00	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cercocarpus montanus																		
S	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	86	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	86	1	-	-	3	2	-	-	-	-	4	2	-	-	200	83	29	6
	94	2	2	-	1	-	-	-	-	-	5	-	-	-	100	59	78	5
	00	-	-	1	1	1	2	-	-	-	5	-	-	-	100	56	65	5

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	29%	00%	00%	-57%
'94	40%	00%	00%	+ 0%
'00	20%	60%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	233	Dec:	-
	'94	100		-
	'00	100		-

Chrysothamnus nauseosus hololeucus																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	5	-	-	-	-	-	-	-	-	5	-	-	-	100	21	21	5
	00	-	1	2	-	-	-	-	-	-	3	-	-	-	60	24	12	3
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	1	-	-	-	1	-	-	1	-	-	2	60			3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	00%	00%	00%	+29%
'00	14%	57%	29%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	0%
	'94	100		0%
	'00	140		43%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ephedra viridis																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
	00	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	4	-	-	-	-	-	-	-	-	4	-	-	-	80	24	30	4
	00	-	-	2	1	1	1	-	-	-	5	-	-	-	100	31	35	5
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	1	-	-	1	-	-	-	1	-	1	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	00%	00%	00%	-11%
'00	13%	75%	13%	

Total Plants/Acre (excluding Dead & Seedlings)				
'86	0	Dec:		0%
'94	180			0%
'00	160			25%

Gutierrezia sarothrae																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	00	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	43	-	-	-	-	-	-	-	-	43	-	-	-	860			43
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	37	-	-	-	-	-	-	-	-	37	-	-	-	740	8	8	37
	00	409	-	-	-	-	-	-	-	-	409	-	-	-	8180	6	5	409
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	17	-	-	-	-	-	-	-	-	12	-	-	5	340			17
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	180			9

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	00%	00%	00%	+92%
'00	00%	00%	01%	

Total Plants/Acre (excluding Dead & Seedlings)				
'86	0	Dec:		0%
'94	760			0%
'00	9380			4%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
Y	86	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	9	-	-	-	-	-	-	-	-	9	-	-	-	180			9
M	86	-	-	-	-	2	1	-	-	-	3	-	-	-	100	122	67	3
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	4	-	-	-	-	-	-	-	-	4	-	-	-	80	-	-	4
X	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'86	33%	17%	00%
'94	00%	00%	00%
'00	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	200	Dec:	-
	'94	0		-
	'00	260		-

Opuntia spp.																		
S	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	6	-	-	-	-	-	-	-	-	6	-	-	-	120	3	13	6
	00	5	-	-	-	-	-	-	-	-	5	-	-	-	100	4	14	5
D	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	00	2	-	-	-	-	-	-	-	-	-	-	-	2	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'86	00%	00%	00%
'94	00%	00%	00%
'00	00%	00%	22%

%Change

+22%

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	0%
	'94	140		14%
	'00	180		22%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Pinus edulis																		
Y	86	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	86	3	-	-	-	-	-	-	-	-	3	-	-	-	100	59	48	3
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	00	2	-	-	6	-	-	-	-	-	8	-	-	-	160	-	-	8

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	00%	00%	00%	
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	166	Dec:	-
	'94	0		-
	'00	180		-

Purshia tridentata																		
Y	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	94	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	00	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
M	86	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	94	-	2	-	1	-	-	-	-	-	3	-	-	-	60	6	12	3
	00	-	-	-	-	-	-	-	-	-	-	-	-	-	0	33	72	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'86	00%	00%	00%	
'94	67%	00%	00%	-67%
'00	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'86	0	Dec:	-
	'94	60		-
	'00	20		-